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ABSTRACT

Using multiple choice tests and a statistical method designed to identify flagrant cheaters, the authors undertook to determine (1) the magnitude of cheating on take-home and open-book exams; (2) whether the amount of cheating varied according to three types of examinations (closed-book, open-book or take-home); and (3) if cheating was affected by the type of credit awarded. There was little evidence of cheating on open-book and/or take-home examinations. It does not appear that cheating is more of a problem for open-book and take-home examinations than for closed-book types. Results indicate that motivational factors may affect the amount of cheating on examinations. (Author)

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CHEATING: A PROBLEM WITH TAKE-HOME EXAMS?

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CHEATING: A PROBLEM WITH TAKE HOME EXAMS?

While numerous investigations have been conducted on cheating by students in classroom situations (Wildemuth, 1976, cited 89 articles in a ten year period) no research was found which indicated the extent of cheating on take-home or open-book examinations. Since such testing practice is common at many colleges it seemed appropriate to study it and determine if problems related to cheating might prevent its use as an alternative to more conventional testing modes. Specific questions were designed to provide information about the following:

1. Is the amount of cheating on open-book and/or take-home examinations of sufficient magnitude to preclude their use as a viable student evaluation procedure?
2. Do differences in the amount of cheating by students vary according to the type of examination (closed-book vs. open-book vs. take-home) that is administered?
3. Is the amount of cheating affected by motivational factors, i.e. varying the conditions for awarding credit for performance on exams?

Our inquiry into related research led us to conclude that cheating by college students is widespread. While providing an accurate figure about the percent of students who cheat is impossible, since behavior which constitutes cheating has not been well defined, it may be conservative to suggest that as many as half of the students in college cheat. Ackerman (1971) reports that 15%-81% of students cheated in studies he reviewed and that 48% cheated in the research he conducted. Barnes (1975), Sherrill et. al. (1971), and Zastrow (1970) identified respectively, 36%, 40% and 66% of the subjects in their studies as cheaters.

A factor contributing to the lack of reliable data about the percent of students who cheat on college examinations has been the failure to develop effective devices for detecting cheating. The establishment of a system which would allow us to catch cheaters "in the act" is unrealistic. It would be too expensive -- or inefficient; and the sometimes used practice of setting up a sham situation where students are permitted, if not encouraged, to cheat has been challenged on ethical grounds (Ackerman 1971).

To overcome the problem of detecting cheating, many researchers rely on stochastic processes, which possess varying amounts of statistical sophistication. That is, they use methods by which students' answers are compared to those of other students and, based on the probability of the similarity of responses, judgments are made about the amount of cheating that occured. Several researchers whose work was reviewed either used or recognized the value of such methodologies (Buss and Novich, 1980; Houston, 1976a, 1976b; Sherrill et.al., 1971; Frary et.al., 1977; Barnes, 1975). For our study, Frary's procedures were adopted.

PROCEDURES

Students (n=114) in four sections of an undergraduate eduational psychology class comprised the sample for this research. Because we were interested in knowing if cheating was affected by motivational factors, two separate studies were conducted, one in which students were awarded extra credit (bonus points) based upon their test scores; the other in which the tests themselves counted as part of the regular grade. For students taught in the two winter quarter sections, Study

1, participation was voluntary, and they were given extra credit based upon their scores on three exams. Participation was mandatory for students in the spring quarter classes, Study 2, and grades from the three exams counted as a part of the final grade.

In the first study 64 students were randomly assigned to one of three groups (N=22, 21, and 21 in groups 1, 2, and 3, respectively). In the second study 50 students were randomly assigned to three groups (N=17, 17, and 16). The subjects took three multiple choice tests which were administered periodically during the school term. Each test consisted of twenty multiple choice items selected from the instructor's manual and students' study guide for the course textbook, Educational Psychology, by Gage and Berliner (1979).

In each study three different examinations (Forms A, B, and C) were administered during the school term. On each occasion one-third of the students took the exam in a closed-book format; one-third in an open-book format; and one-third in a take-home format so that each student experienced each treatment, exam mode, once.

Indices of cheating were computed for each of the six subtests using Frary, et.al., (1977). These indices reflect the probability that the responses of two examinees were due to chance.

FINDINGS

Data relevant to research questions one and two which pertained to the amount of cheating on take-home examinations and whether cheating varied significantly across three exam modes (closed-book, open-book and take-home tests) are presented in Table 1. Our results showed that cheating was not widespread, nor was it more of a problem with

take-home examinations than with the other two types. If we examine the combined results for all students in both studies, we would identify ten students as cheaters, out of a possible 320 occurrences, a 3% rate. This value is surprisingly low when compared to other studies which reported the cheating rate to be 50%. The only identified cheaters were those who participated in Study 1.

In conversations with Frary, whose method for detecting cheating was used in our study, we inquired into the apparent discrepancy between our results and those of others. Frary said that his procedure is a conservative one, because he is reluctant to label students as cheaters on the probability that their answers are similar to those of other students. He argues that such decisions should not be made hastily or on faulty evidence. Only if the degree of similarity between students' responses is very high, so that reasonable doubt can be discounted, would Frary be willing to bring cheating charges against them. Consequently, his logic permits only the identification of flagrant offenders. Frary indicated that, from results of hundreds of cases, the percent of cheaters he has identified would range between 10%-15% per class. When the results of our studies are compared to the conservative figures reported by Frary, we would still be inclined to say that cheating on take-home tests is <u>not</u> a major problem.

In addressing the second research question, differences in cheating among the three exam modes, our findings showed that they did not exist. Chi-square tests were conducted for both studies and for their combined results and none approached significance. Perhaps the only observation worth mentioning is that, from data presented in Study 1,

there may be a tendency for cheating to increase as the school term progresses. Note that there was a greater likelihood that cheating occurred on the third test in Study 1 than on the first one (Table 1). Such results may have been due to increased familiarity among students in the class; that there was a need to cheat more at the end of the term than at the beginning; because the students got bolder; or for other reasons. Regardless, there was no evidence which showed that it increased more for one type of testing mode than for another.

Research has suggested that examination scores of students and their course grades are higher if credit is given based on their performance (Morgan, 1978). Since that fact is reasonably well accepted, we thought it would be interesting to determine if the amount of cheating would vary when a similar amount of credit was awarded under two different grading conditions. Under condition one credit was in the form of bonus points; under condition two credit was a part of the regular course requirements. In both situations the amount of credit constituted about 8% of the final course grade.

Our results indicate that more cheating occurs when credit, in the form of bonus points, was given rather than when the credit was an integral part of the course grade. In the first instance ten students were identified as probable cheaters; in the second instance none were identified. (See Table 1.) Two types of statistical tests of probability were conducted, the standard error for the difference between proportions and chi-square. Values were $z = 2.07$ and chi square = 10.31 (3 df). Both were significant ($p<.05$).

Since it is difficult to explain why differences in cheating occurred in the two studies, we searched for reasons for the apparent discrepancy. In addition to the data on cheating, achievement scores were recorded for students in each of the two studies. Upon examination of the data we found that students in Study 2, where no detectable cheating existed, scored significantly higher than students in Study 1. It may be that the students in Study 1 who cheated did so because they "needed to get their grades up". Such findings incidentally are consistent with Ross (1977) who reported that students with low test scores on tests are more likely to cheat than those having high scores.

SUMMARY AND CONCLUSION

When one considers the substantial number of studies that have been conducted on classroom cheating, it is surprising that virtually no research has been done on the amount of cheating by college students on open-book and take-home examinations. Using mutiple choice tests and a statistical method designed to identify flagrant cheaters, the authors of this paper undertook to determine (1) the magnitude of cheating on take-home and open-book exams; (2) whether the amount of cheating varied according to three types of examinations (closed-book, open-book or take-home); and (3) if cheating was affected by varying the way by which credit was awarded. Findings were highly favorable for the first two inquires. It does not appear that cheating is more of a problem for open-book and take-home examinations than for closed-book types. Such results might well be expected, since "finding the answer in a book", is probably a more reliable and efficient procedure than having to "find the brightest student in the class".

From the results of our study, we would defend the use of open-book and take-home exams by faculty. Rampant cheating by students did not exist. There is little reason to suspect that testing devices permitting students the opportunity to use source material will result in a level of cheating higher than what currently exists.

TABLE 1

Possible Cheaters on Three Types of Examinations

STUDY 1 (=60)

	Closed-Book Examination	Open-Book Examination	Take-Home Examination
Test Form A	0	0	0
Test Form B	0	2	0
Test Form C	3	3	2
Total	3	5	2

STUDY 2 (=50)

	Closed-Book Examination	Open-Book Examination	Take-Home Examination
Test Form A	0	0	0
Test Form B	0	0	0
Test Form C	0	0	0
Total	0	0	0
COMBINED RESULTS (Studies 1 & 2)	3	5	2

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